

Engineering Performance Standards

Public Presentation

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EPA Region 2

The logo for the Hudson River PCBs Superfund Site. It features a stylized blue wavy line representing a river above the words "Hudson River" in a large, dark blue, serif font. Below this, the words "PCBs SUPERFUND SITE" are written in a smaller, blue, sans-serif font.

Hudson River
PCBs SUPERFUND SITE

Site Background

- GE discharged PCBs into Hudson River from 1940s to 1977
- Fort Edward Dam removed in 1973
- USEPA selected cleanup is targeted environmental dredging in Upper Hudson followed by MNA



Remedial Objectives

- Reduce risks and hazards to people eating fish
- Reduce risks to ecological receptors
- Reduce PCB levels in surface water
- Reduce bioavailable PCBs
- Minimize long-term downstream transport of PCBs

Engineering Performance Standards

- Required by ROD
 - Dredging Resuspension
 - Dredging Residuals
 - Dredging Productivity
- Developed with input from NYS, NOAA, USFWS
- Technical analyses performed to support standards
- Public Comment
- Peer review



Performance Standards Purpose

Address public concerns about dredging by developing standards that:

- Will be enforceable
- Promote accountability
- Are based on objective criteria
- Ensure cleanup meets ROD objectives

(USEPA 2002 ROD)

Performance Standards Goals

- Protect Public Water Supplies
- Protect Downstream Water Quality
- Promote Fish Recovery
- Achieve Residual ~ 1 mg/kg Tri+ PCBs
- Keep Dredging Program on Schedule
- Achieve Long-Term Remedy Benefits

Performance Standards and Dredging

Develop Draft Engineering Performance Standards



Public Input on Draft Standards



Peer Review on Draft Standards



Finalize Standards



Phase 1 Dredging



Phase 1 Evaluation and Peer Review



Phase 2 Dredging

Three Required Standards

- Resuspension
- Residuals
- Productivity

Resuspension

Resuspension Performance Standard

Objectives

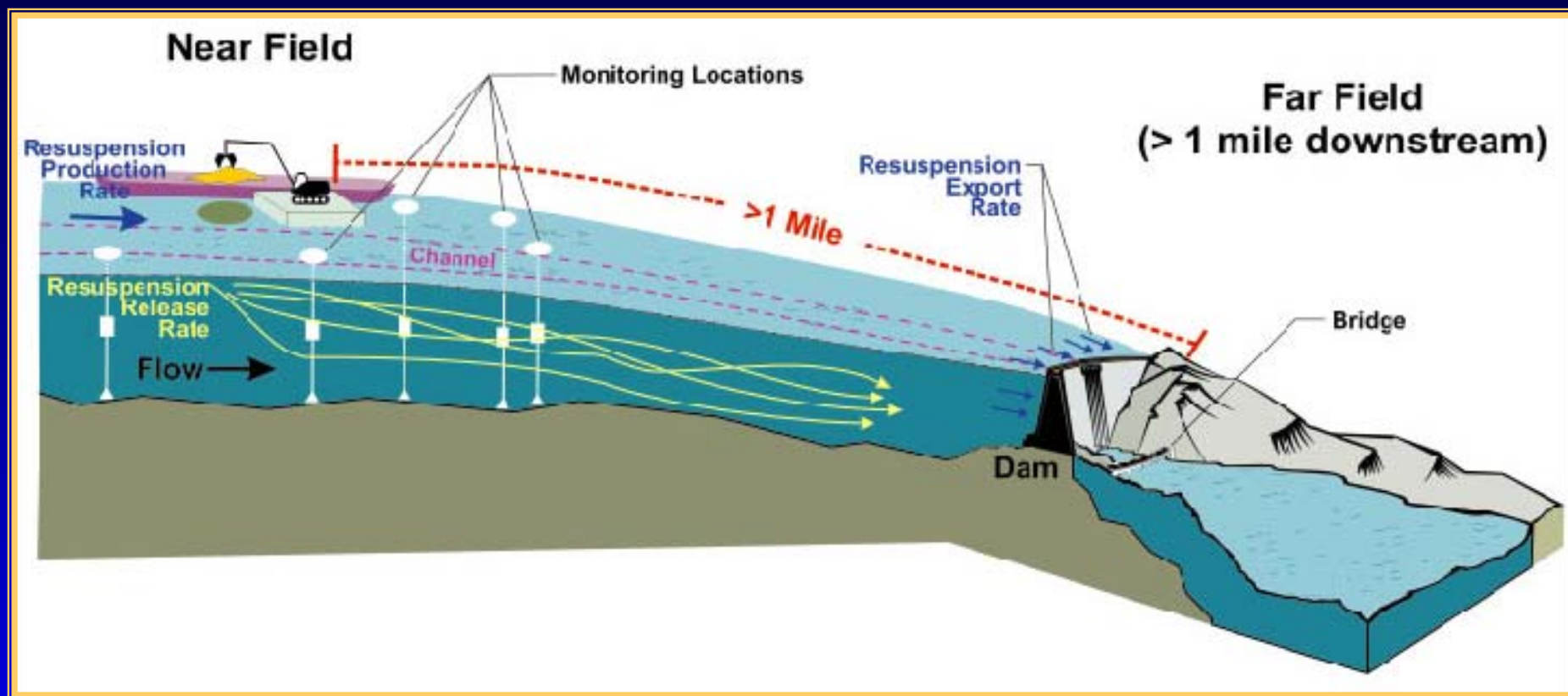
- Protect water supply intakes downstream of dredging operations
- Limit transport of PCB-contaminated sediments downstream
- Promote recovery of the fish after dredging

Resuspension Performance Standard

Components

- **PCB Concentration and Load Limits**
- **Suspended Solids Criteria**
- **Water Column Monitoring Requirements**
 - Upstream
 - Near-Field
 - Far-Field
- **Engineering Contingencies**

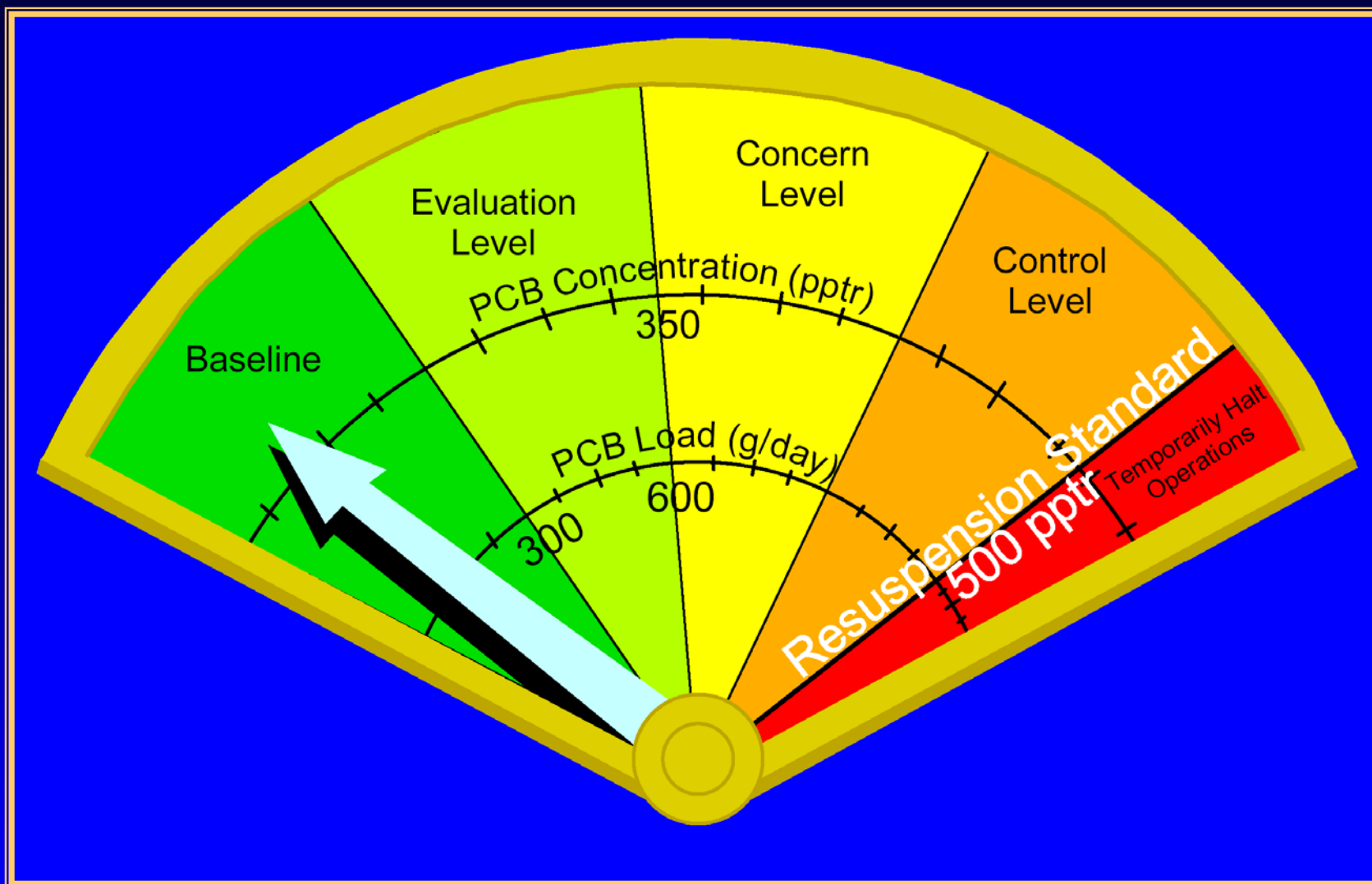
Definitions



Resuspension Criteria

- Action Levels
 - Evaluation Level
 - Concern Level
 - Control Level
- Resuspension Standard Threshold
 - Confirmed exceedance of 500 pptr

Resuspension Criteria (cont'd)



Resuspension Criteria (cont'd)

- **Action Levels**

- **Evaluation Level**

- PCB load and suspended solids criteria (*suspended solids results subject to confirmation by PCB sampling*)
 - Minimum level of detection for dredging-related PCB export load for 1 week

- **Concern Level**

- Twice the PCB export load relative to the Evaluation Level for 1 week
 - PCB concentrations at 70 percent of the Federal MCL for 1 week

Resuspension Criteria (cont'd)

- **Action Levels (cont'd)**

- **Control Level**

- PCB concentration and load criteria equivalent to Concern Level
 - Detected for 4 consecutive weeks

- **Resuspension Standard Threshold**

- Confirmed exceedance of **500 pptr** over a 24-hour period

Engineering Contingencies

Action Level	Monitoring Contingencies Required	Engineering Evaluation Required	Engineering Contingencies Required
Evaluation	Yes	Recommended	No
Concern	Yes	Yes	No
Control	Yes	Yes	Yes
Resuspension Standard Threshold	Yes	Yes	Yes - Temporarily Halt Operations



Residuals

Residuals Performance Standard

Objectives

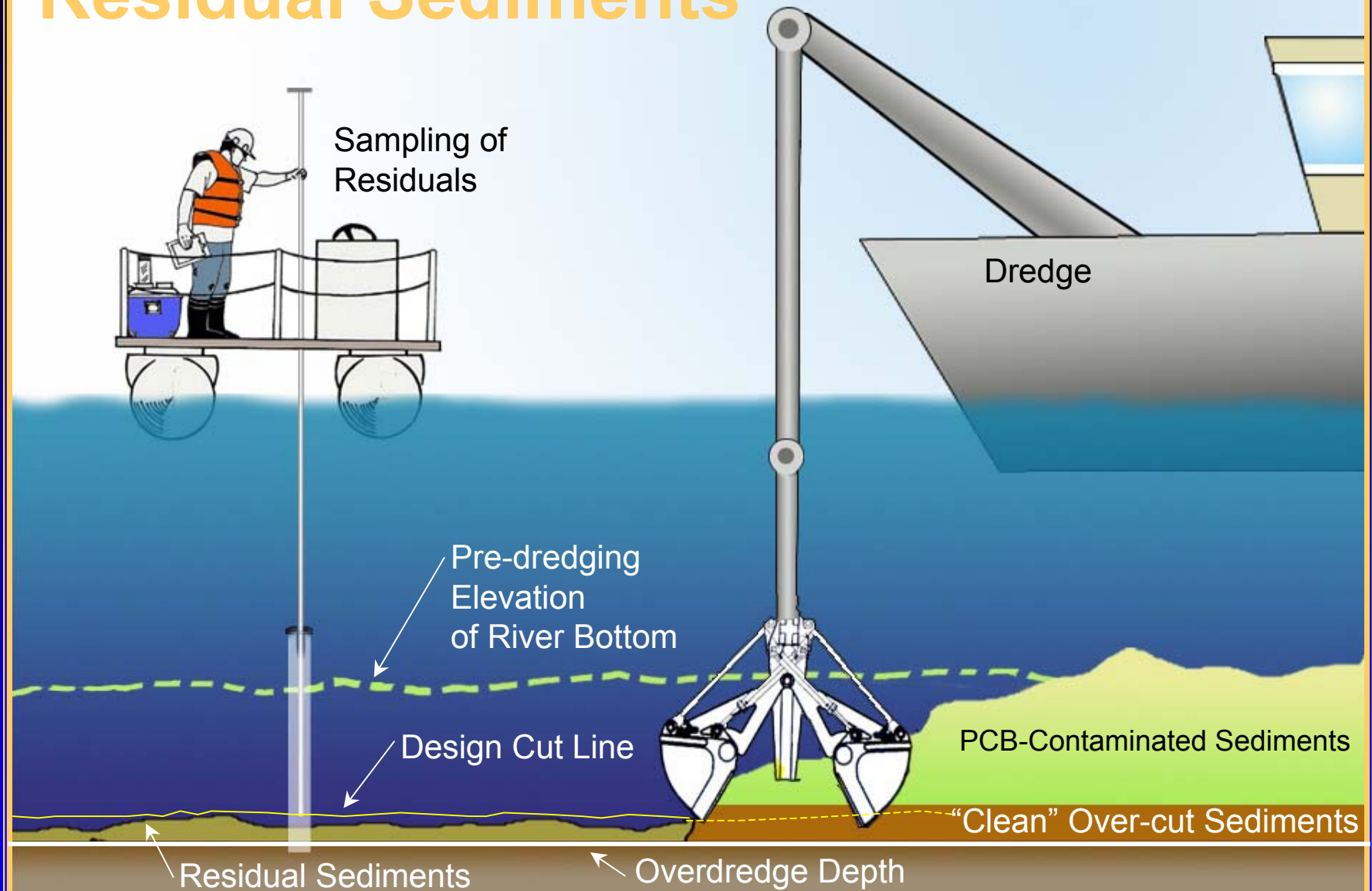
- Detect and manage contaminated sediments that may remain after initial remedial dredging
- Verify achievement of anticipated residual of ~1 mg/kg Tri+ PCBs (prior to backfilling)

Residuals Performance Standard

Components

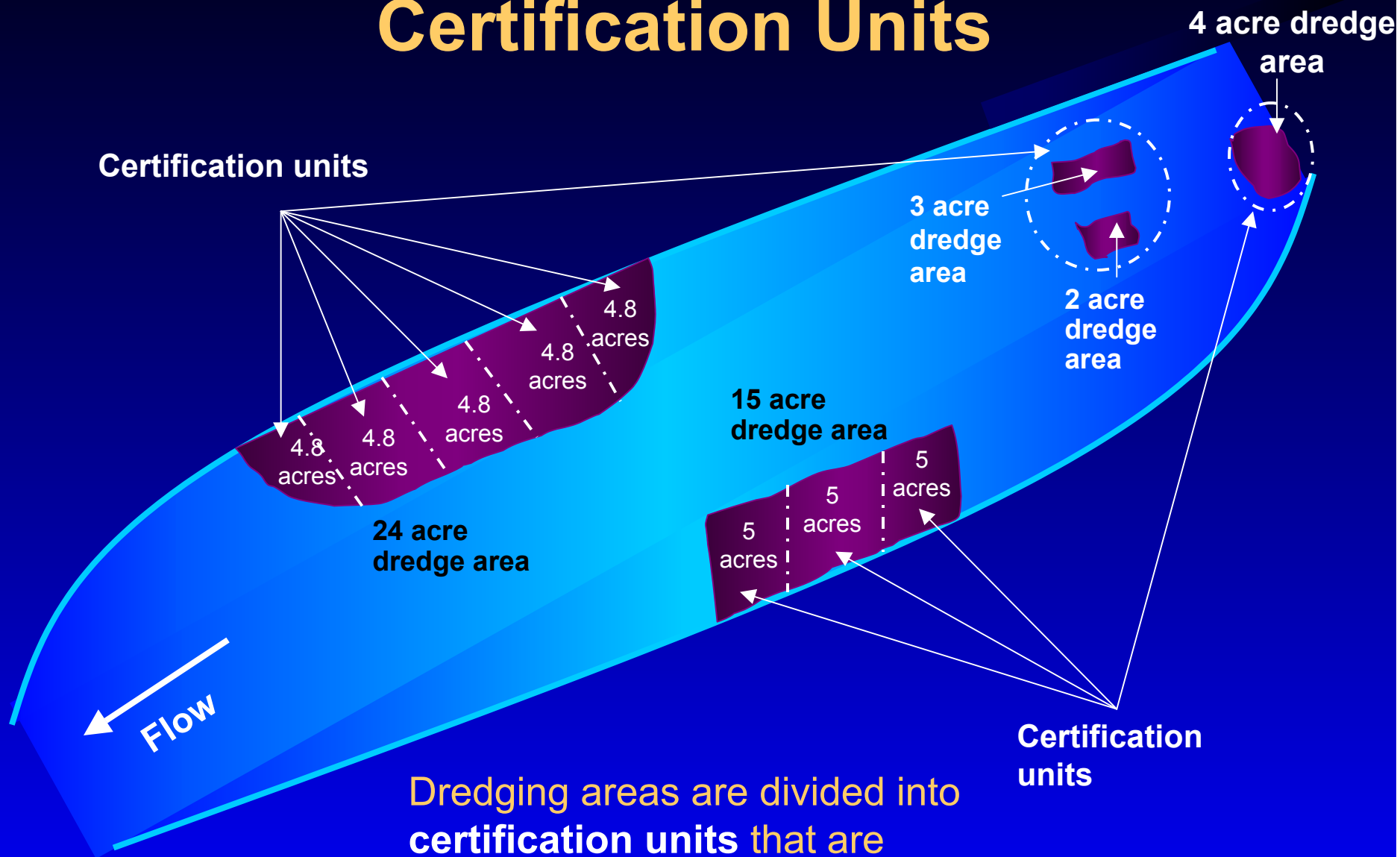
- Implement a post-dredging sampling and analysis program to characterize PCB concentrations
- Direct the comparison of collected data to the ROD clean-up goal and statistical action levels
- Determine the next step based on program findings

Residual Sediments



Certification Units

Certification units

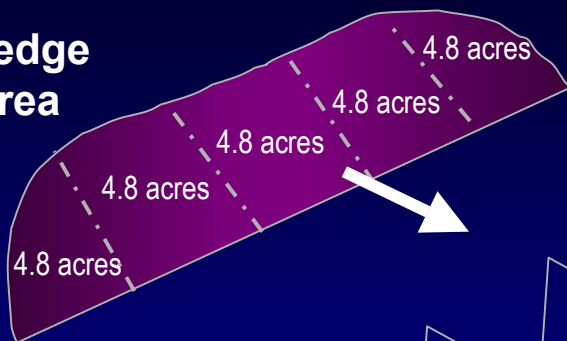


Dredging areas are divided into **certification units** that are approximately 5 acres in size

Certification units

Post-Dredging Sampling

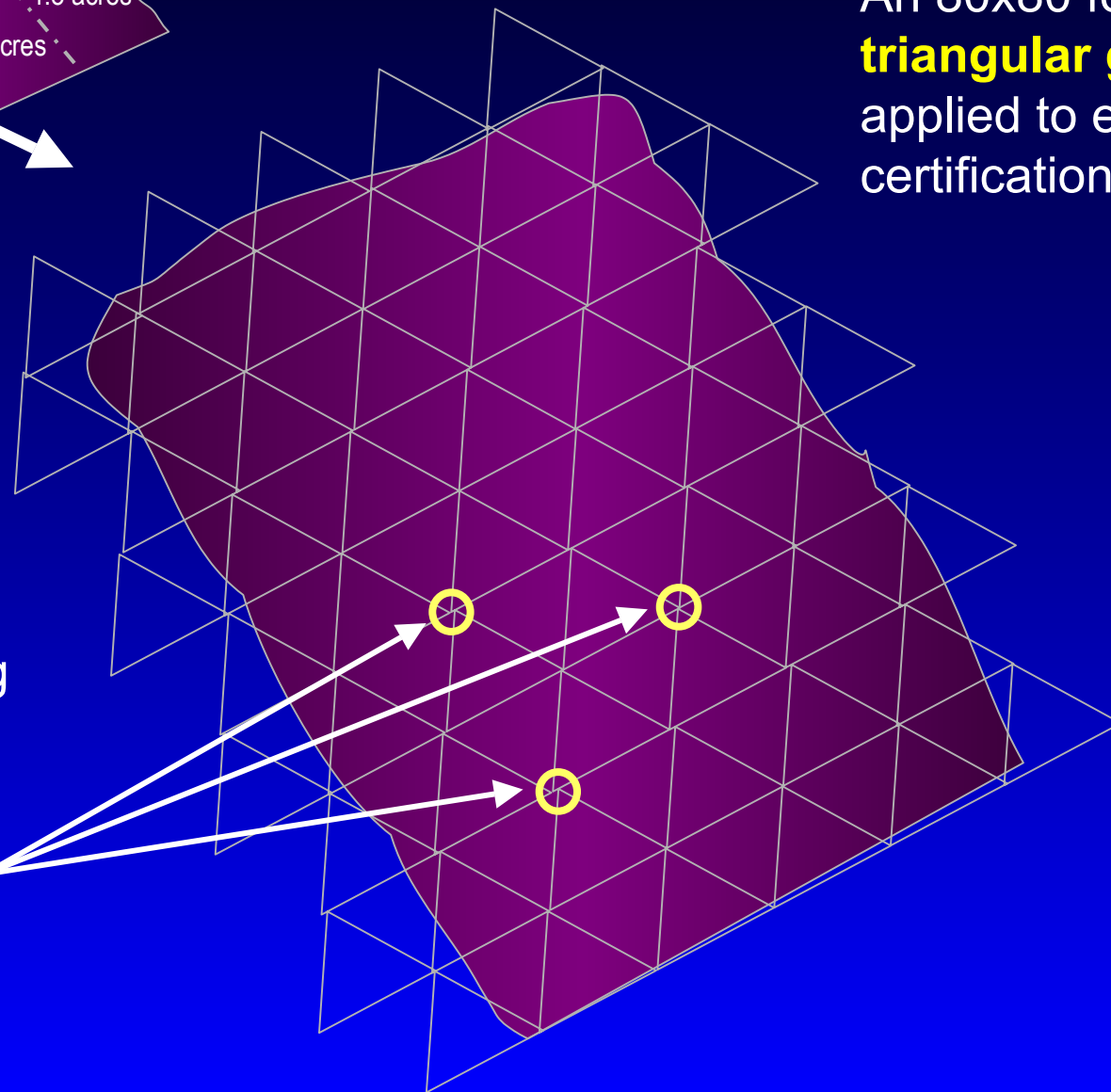
Dredge
area



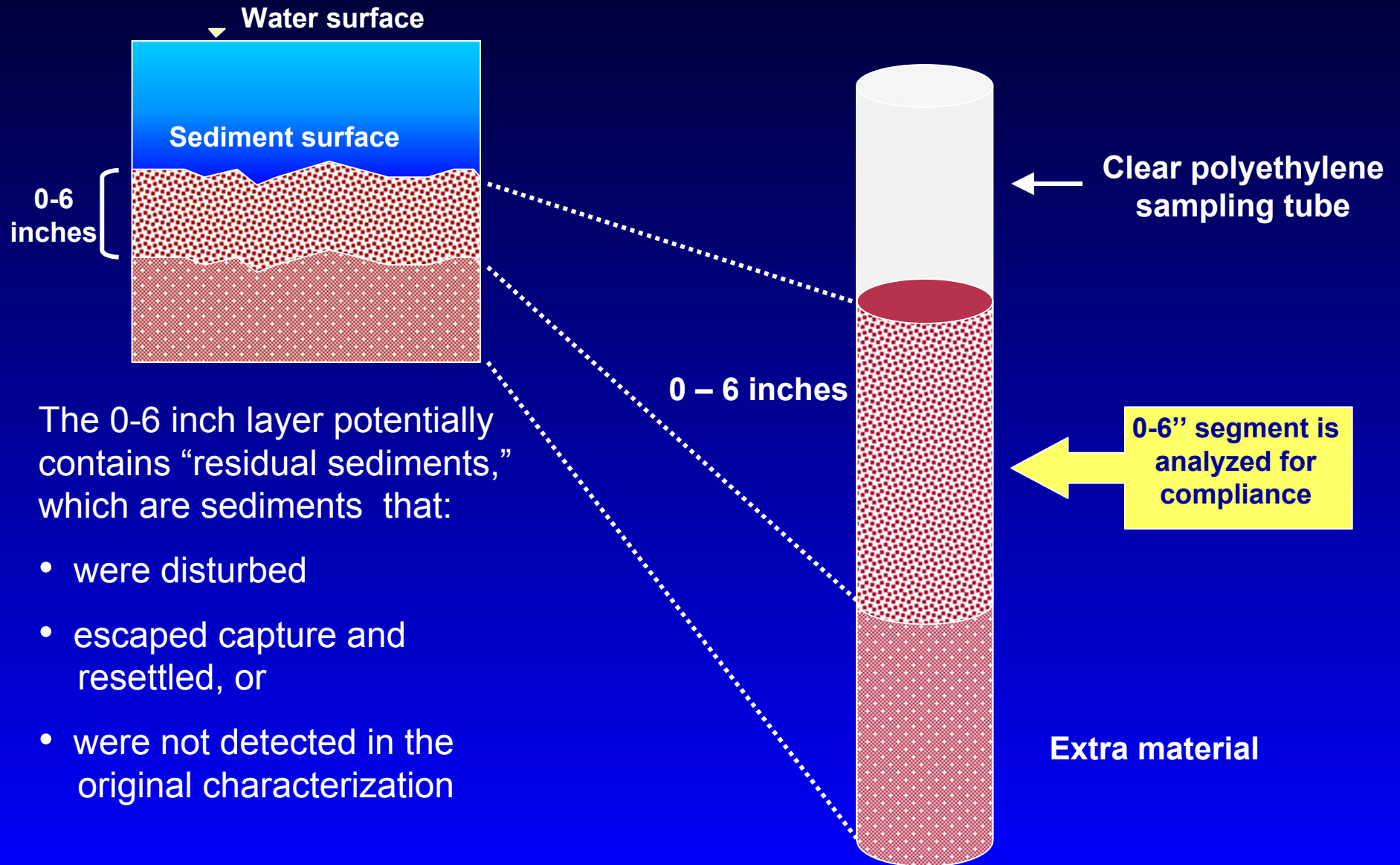
An 80x80 foot
triangular grid is
applied to each
certification unit.

Core samples are
collected at 40
individual **sampling
nodes** spaced along
the grid.

**Sampling
nodes**



Sediment Core



Application of the Standard

Collect samples and perform statistical analysis



Compare to ROD requirement of ~1 mg/kg Tri+ PCBs



Area can be backfilled without testing backfill



Re-dredge or construct sub-aqueous cap



Additional sampling and re-dredging required



Jointly evaluate 20 – acre area

Implement contingency actions

Productivity

Productivity Performance Standard

Objective

- Monitor and maintain the progress of the dredging to meet the 6-year duration stated in the ROD



Productivity Performance Standard

Components

- Complete dredging in 6 years
 - Phase 1: One year at reduced scale
 - Phase 2: Five years at full scale
- Backfill and stabilize shoreline by end of each year
- Process and transport sediment to offsite disposal by end of each year

Productivity Performance Standard Volumes

Dredging Season	Required Cumulative Volume (cubic yards)	Target Cumulative Volume (cubic yards)
Phase 1: Year 1	approx. 240,000	265,000
Phase 2: Year 2	720,000	795,000
Year 3	1,200,000	1,325,000
Year 4	1,680,000	1,855,000
Year 5	2,160,000	2,385,000
Year 6	2,650,000	2,650,000

Productivity Standard Action Levels and Required Responses

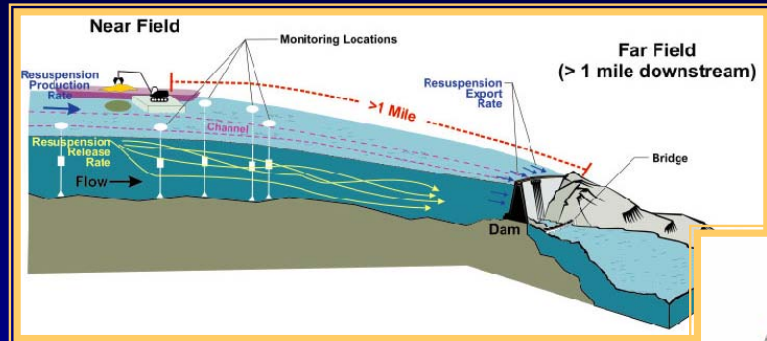
Action Level	Situation	Response
Concern Level	Monthly shortfall of 10 % or more	Notify USEPA and work to erase shortfall over the next 2 months
Control Level	Shortfall of 10 % or more for 2 or more months	Submit action plan to USEPA and erase shortfall by the end of the season
Productivity Standard Threshold	Annual cumulative volume shortfall	USEPA action to be determined based on Agency review of specific circumstances

Conclusions

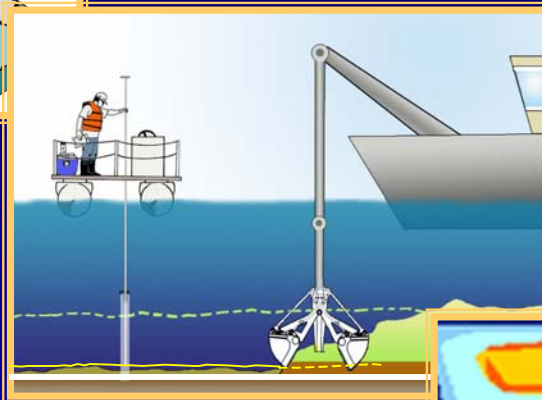
- Action levels set by Resuspension Standard are protective
- Compliance with Resuspension Standard forecast to avoid serious long-term impact
- Residual of ~1mg/kg Tri+ PCBs is achievable
- Dredging can be completed in six years while achieving Resuspension and Residuals Standards

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Resuspension



Residuals



Productivity



Peer Review Process

1st Peer Review covers

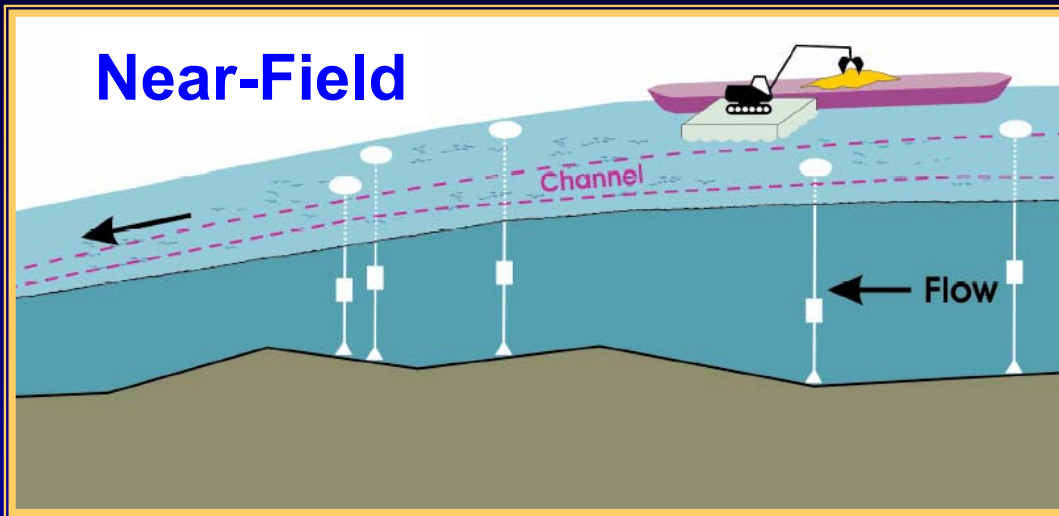
Draft Engineering Performance Standards
modified as appropriate based on public
comment

2nd Peer Review covers

Evaluation of Phase 1 dredging with
respect to Engineering Performance
Standards

Monitoring Locations

Near-Field



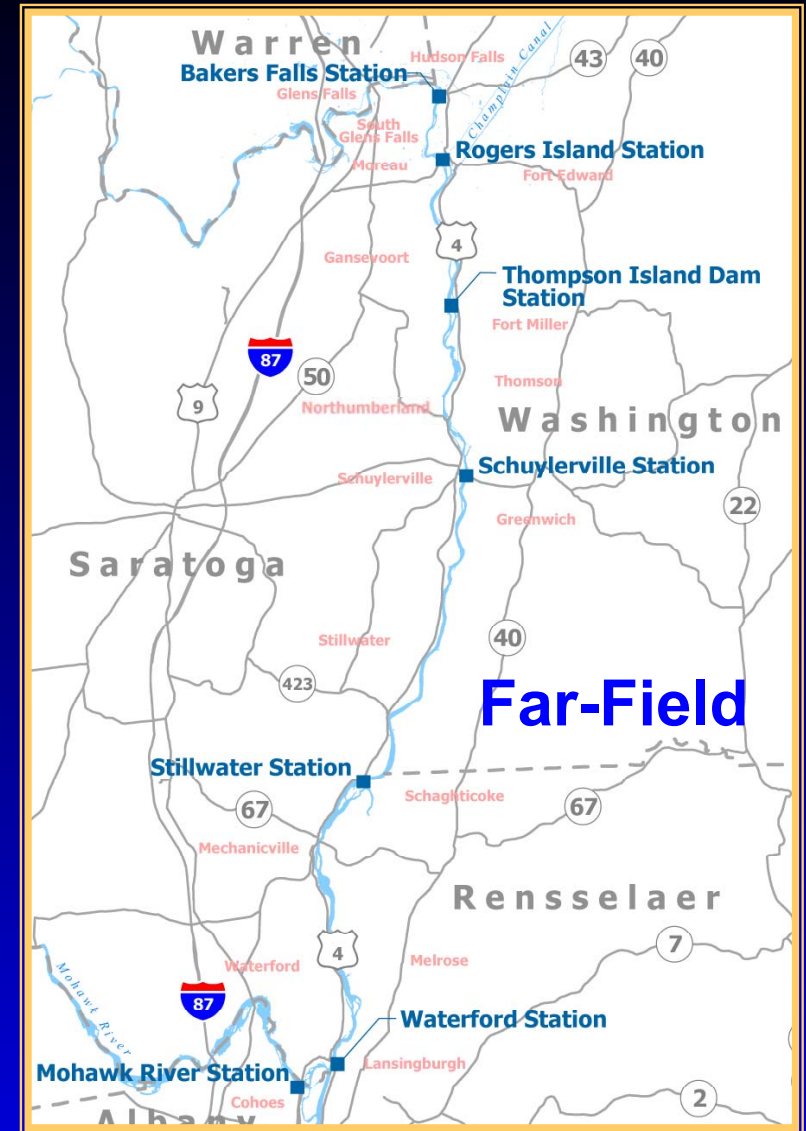
Primary Parameters

Near-Field

- Turbidity
- Suspended Solids

Far-Field

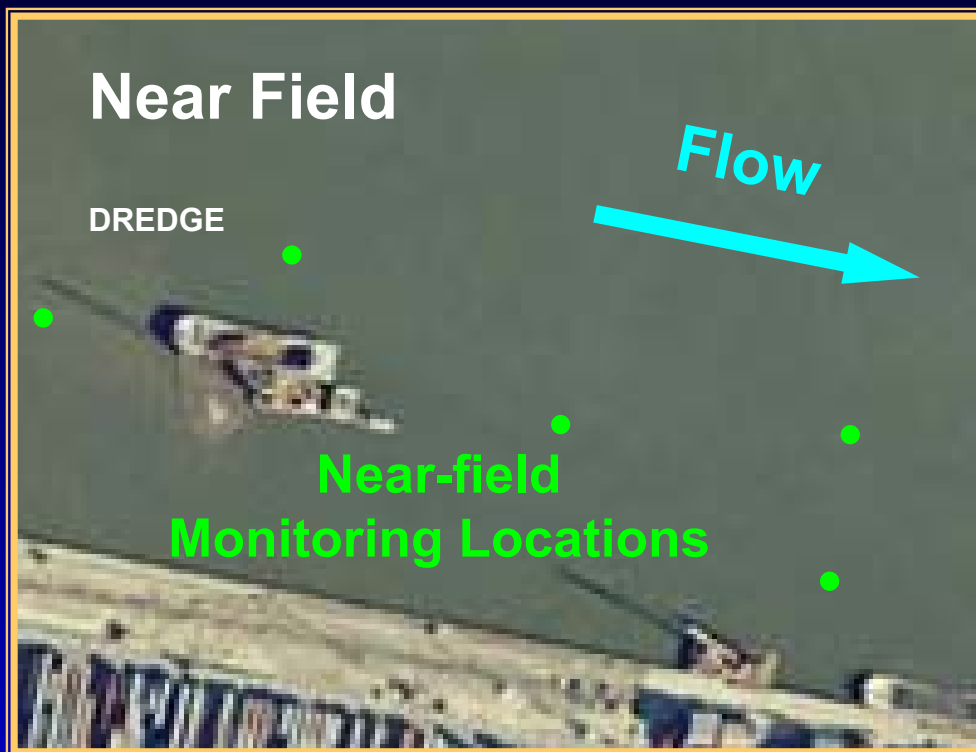
- PCB Congeners
- Turbidity
- Suspended Solids



Plus Lower Hudson River Stations:

- Albany
- Poughkeepsie

Monitoring Locations



Elizabeth Marine Terminal - Development Program

Primary Parameters

Near-Field

- Turbidity
- Suspended Solids

Far-Field

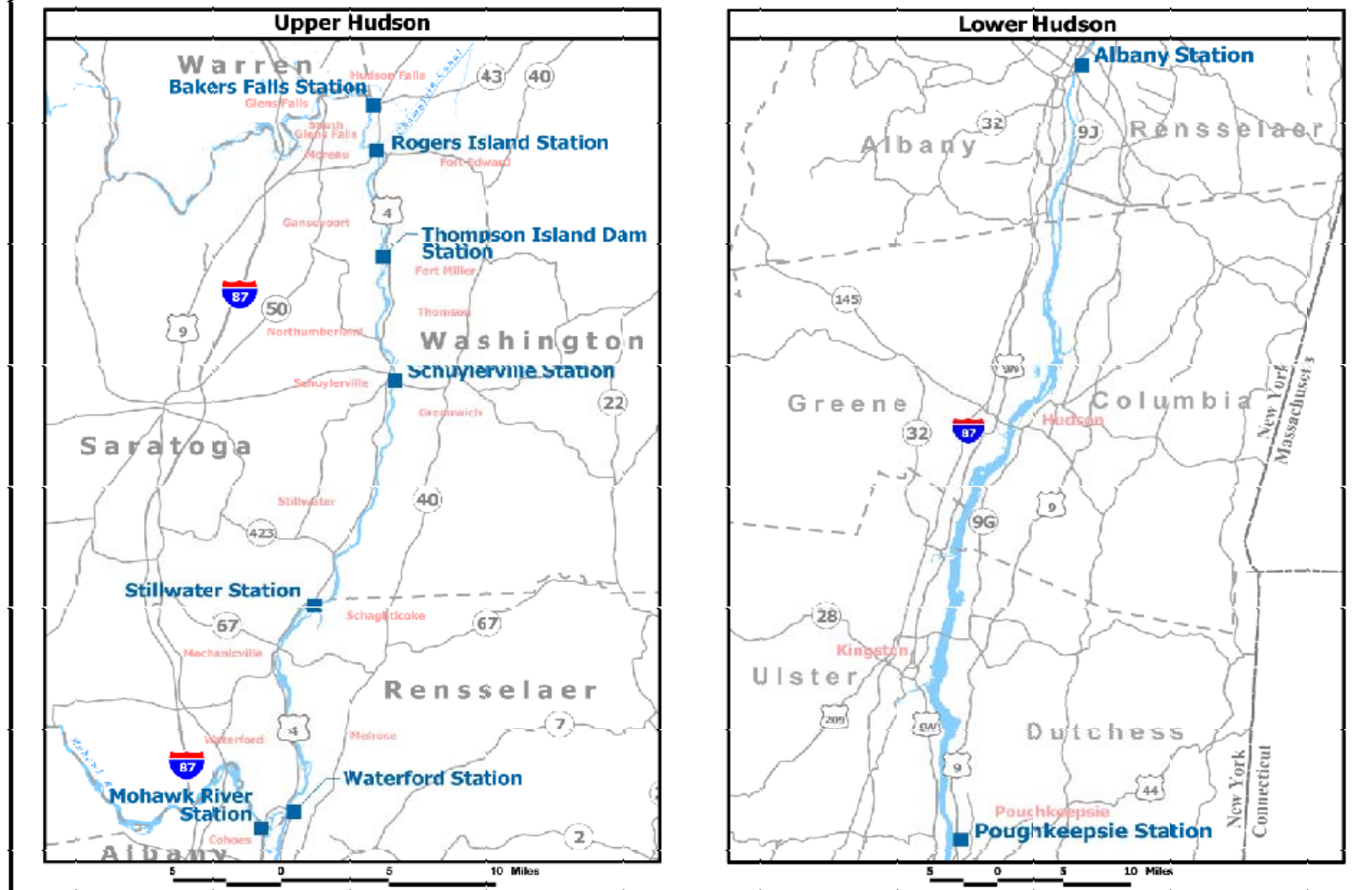
- PCB Congeners
- Turbidity
- Suspended Solids



Plus Lower Hudson River Stations:

- Albany
- Poughkeepsie

Far-Field Stations in the Hudson River



Resuspension Criteria (cont'd)

- **Action Levels**

- **Evaluation Level**

- PCB load and suspended solids criteria (*suspended solids results subject to confirmation by PCB sampling*)
 - Minimum level of detection for dredging-related PCB export - **300 g/day** for 1 week

- **Concern Level**

- Twice the PCB export load relative to the Evaluation Level - **600 g/day** for 1 week
 - PCB concentrations at 70 percent of the Federal MCL - **350 ppb** for 1 week

Resuspension Criteria (cont'd)

- **Action Levels (cont'd)**

- **Control Level**

- PCB concentration and load criteria equivalent to Concern Level - **600 g/day or 350 pptr**
 - Detected for 4 consecutive weeks

- **Resuspension Standard**

- Confirmed exceedance of **500 pptr** over a 24-hour period